

REMARKS

The Office action of March 27, 2003, has been carefully considered.

Claims 1, 3 through 9 and 11 have been rejected under 35 USC 102(b) as anticipated by Hausler.

The invention is directed to a method and apparatus of detecting a deposit that would form on the inside of a fluid transport pipe comprising applying a thermal gradient to at least one active zone on the outside surface of the pipe, measuring the heat flux in at least one zone of the outside surface of the pipe that is situated at a given distance from the active zone along the length of the pipe, and detecting when the heat flux corresponding at least in part to the applied thermal gradient and transmitted by the pipe exceeds a determined threshold which indicates the presence of a deposit inside the pipe. The apparatus thus comprises at least one source for producing a thermal gradient constructed and arranged for mounting on an active zone on the outside of the pipe and at least one measurement sensor for measuring heat flux which is constructed and arranged for mounting on a zone of the outside surface of the pipe at a given longitudinal distance from the active zone.

The Hausler reference discloses measuring fouling on metal surfaces of a pipe by effecting a temperature differential measurement of heat conductivity through a heated conductive metal piece which is mounted to have one surface exposed to the liquid flow, with a thermocouple positioned opposite to the heated metal piece and penetrating to the interior of the pipe.

Thus, both the heating and the temperature measuring are done in a different manner from the claimed invention. In Hausler, the heated metal piece is not placed against the wall of the pipe, but rather extends through the wall of the pipe so that it is exposed to the liquid flowing through the pipe. Moreover, the thermocouple does not measure the temperature of the surface of the pipe, but rather extends within the pipe so that it is within the liquid flow of the pipe.

The claimed invention is thoroughly different from the method of Hausler, since the claimed invention applies heat to the surface of the pipe and measures heat flux on the surface of the pipe at a given longitudinal difference from the heat application. According to Hausler, there is no longitudinal distance between the heat application and the heat measurement.

Withdrawal of this rejection is accordingly requested.

Claims 2 and 10 have been rejected under 35 USC 103 over Hausler in view of Ludington et al. The patent to Hausler has been discussed in detail above and Applicants rely on that discussion.

Ludington et al discloses cycling a heat source for physical characterization of biochemical products, but is not otherwise related to the claimed invention, and does not cure the defects of the Hausler reference. Withdrawal of this rejection is requested.

Claim 12 has been rejected under 35 USC 103 over Hausler in view of Ivanets et al. Hausler has been discussed in detail above, and Applicants rely on that discussion.


Ivanets et al discloses a band around a pipe having two measurement sensors. However, to the extent that this reference can be understood, it does not disclose or suggest placing a heat source at a longitudinal distance from a heat flux sensor. Moreover, this disclosure is specifically contrary to the teachings of Hausler which requires both the heat source and the thermocouple to be in contact with the fluid, and Applicants submit therefore that Ivanets et al would not in any event be combined with Hausler.

Withdrawal of this rejection is requested.

The specification has been amended to add proper subject matter headings and the claims have been amended to generally place them in better form for U.S. practice.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



Ira J. Schultz
Registration No. 28666